LIBRARY
RECEIVED
★ FEB 25 1932 ★
U. S. Department of Agriculture

THE PLANT DISEASE REPORTER

Issued By

Division of Mycology and Disease Survey

Volume XVI Number 2

February 15, 1932

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE PLANT DISEASE REPORTER

Issued by

THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Vol. XVI February 15, 1932 Number 2

FRUIT DISEASES

APPLE DISEASES IN UNSPRAYED ORCHARDS IN PENNSYLVANIA 1929-1930-1931

R. S. Kirby

(The report that follows is a part of a summary of the occurrence of apple diseases in Pennsylvania, during the years 1929, 1930, and 1931. Scab is severe throughout the State, while the other diseases are most severe in the southeastern part and become less common the further one goes to the north or west. The value of the different spray applications is also discussed.)

During the past three years a special effort has been made to get information on the occurrence of the different diseases on the fruit at harvest time. A total of 935 orchards, including unsprayed, partly sprayed and completely sprayed have been visited and 485,097 apples examined and records made of the occurrence of disease on each apple, and of the spraying program followed. The orchard counts were made by R. S. Kirby, G. L. Zundel, and L. T. Denniston.

A knowledge of the diseases present in unsprayed orchards is of prime importance since such information is the only way to know what diseases we are combating when spraying. Table 2 shows the percentage of the six most common diseases present in unsprayed orchards in Pennsylvania in 1929, 1930, and 1931.

Table 2 - Percentage of disease present in unsprayed orchards; and amount of rainfall in 1929, 1930, and 1931.

Year	Percentage of diseased apples						
	Scab	Sooty Blotch	Brooks Spot	Blotch	Black Rot	Rust	Total
1929	87.2	9.2	4.4	1.0	.6	.01	100.
1930	73.9	8.7	7.5	2.2	.2	.01	92.5
1931	80.5	46.	8.	3.9	1.5	.20	100.
Aver.	80.2	24.4	6.8	2.6	.8	.07	97.5

	Rainfall in Inches					
	April	May	June	July	August	Total
1929	6.12	4.81	3.56	2.81	2.52	19.82
1930	2.71	3.03	4.20	2.23	1.47	13.64
1931	3.33	5.28	3.71	5.28	4.01	21.81

Note: Figures based on counts of 7,368 apples in 52 orchards in 1931, of 5,282 apples in 39 orchards in 1930, and of 4,976 apples in 19 orchards in 1929.

The figures in Table 2 show conclusively that very few apples free of disease can be produced without spraying in Pennsylvania; that scab (Venturia inaequalis) is the most important single disease of apples within the State; that sooty blotch (Gloeodes pomigena) is of second rank followed by Brooks spot (Mycosphaerella pomi), blotch (Phyllosticta solitaria), black rot (Physalospora malorum), and rust (Gymnosporangium spp.)

The effect of rainfall on the occurrence of the different diseases is worthy of note. The year 1929 represented one of the worst scab years of recent times, yet the total rainfall was not

as great as in 1921. This condition was apparently due to the excessive rainfall during April, 1929, which enabled scab to bring about severe early infections; while in 1931 there was very little rain until after blooming or the middle of May. In 1930 there was an average of 73.9 per cent scabby apples which was 6.3 per cent below the three-year average but when it is remembered that during the dry season of 1930 there was a deficiency of 7.02 inches of rainfall below normal between April and September, it appears that scab even under adverse weather conditions is a menace that can only be held down by proper control measures. The figures in Table 2 show also that such diseases as sooty blotch, Brooks spot, blotch, and black rot are not affected materially by the early season or pre-blossom rains but are proportional to the amount of summer or after-blooming rains.

KEEPING QUALITY OF THE MASSACHUSETTS CRANBERRY CROP OF 1931

Neil E. Stevens

Judged by the high standards prevailing in the industry, the Massachusetts cranberry crop of 1931, which has just been marketed, was of unusually poor keeping quality. It was undoubtedly poorer than the crop of 1922, and in the opinion of some observers, it was inferior even to the notorious crop of 1914. An idea of the relative amount of loss from decay during recent years may be gained from a comparison of the average amount of decay in storage lots from representative bogs in Plymouth County during the last four years as shown in Table 3. The figures given are for the condition on November 15 when the fruit had been in storage approximately two months. Similar differences appeared on October 15.

The Early Black is the most important variety, and makes up approximately half the total production. The Howes is second in importance and is the standard late variety. Eight to ten lots were stored for each variety.

Table 3. Average condition of test storage lots of cranberries expressed as percentage of rotten berries, November 15.

Variety	Percentage rotten November 15.			
	1928	1929	1930	1931
Early Black	7.4	11.	13.1	31.
Howes	6.5	9.	6.7	14.1
Odd Varieties	12.2	18.	15.6	30.5

The condition of the crop is apparently correlated with unusually high temperatures in May and June combined with an unusual number of rainy days in July and August. This combination of weather conditions has occurred only four times in the last twenty years, in 1914, 1919, 1922, and 1931, all years in which the crop showed poor keeping quality.

NOTES ON THE IMPORTANCE OF SOME FRUIT DISEASES IN NORTH CAROLINA IN 1931

R. F. Poole

Dewberry anthracnose (Plectodiscella veneta): In 1925 Wolf and Dodge wrote of severe anthracnose of dewberries in the sandhill area of this State. In 1926, 1927, 1928 and 1929, the disease was of only minor importance in the same area. Even in 1930 there was minor infection of berries, but a definite increase in infection of leaf and cane on Lucretia dewberries. During 1931, the disease was of major importance, and a very large percentage of the crop was destroyed or became unprofitable. Heavy infections of berries occurred during June while conditions were dry.

In this irregularity of infection it is possible that the disease would have been equally as severe in other seasons if the same amount of inoculum had been carried over as during 1930. However, since some inoculum was carried over every year, it seems logical that the epidemic nature was more definitely related to the seasonal conditions.

Black rot of grape (Guignardia bidwellii): The black rot disease of grapes occurs in this State every year, but is much worse some seasons than in others. The disease was severe during 1931, and the conditions under which it developed are worthy of note. The previous year was not very favorable for black rot, since it did not cause serious damage either to fruit or to twigs, consequently the wood infection beginning with 1931 was of very little importance even on the very susceptible Vinifera types. The drought periods during the early formation of the fruit were not favorable for more than slight infection, but before the berries had reached the size of a pea, leaves of Muscadine, Scuppernong, and European varieties had developed spots, with mature spores, which were the most probable sources of new infections. The loss during the wet period just previous to ripening was great in unsprayed vineyards. The infection of wood, however, during the autumn season when conditions were dry was the most severe seen in recent years. Bearing wood is destroyed on some of European varieties, and the carry over of a heavy inoculum for 1932, is assured.

Bitter pit of apples (non-par.): The drought period of 1930 extended well into the mountain areas, where apples are grown commercially. Much of this section experienced a severe drought again in 1931. Along with this condition the apple crop was generally heavy. Such varieties as York, Grimes Golden, and Stayman were severely injured by bitter pit while Ben Davis, Delicious, and Limbertwig were affected to a minor degree. On some trees near Mount Airy affected apples amounted to 90 per cent, many of which were badly pitted. The disease was severe not only at high elevations, on the ridges, but equally as prominent in the Valleys along streams and in the level country of the Piedmont. It is questionable whether heavy pruning would have given satisfactory control, since the disease was severe also on trees bearing a small crop. The drought conditions, besides being associated with and probably the cause of bitter pit, greatly affected the size of the fruit during the two seasons. A very definite lack of tree growth is also evident.

V E G E T A B L E D I S E A S E S

POTATO DISEASES IN MAINE, 1930 AND 1931

Reiner Bonde

ESTIMATED YIELD LOSSES FROM LATE BLIGHT IN AROOSTOOK COUNTY FOR 1930 AND 1931: The actual loss from this disease is very hard to estimate. The writer and Mr. Beverly, County Agent of Aroostook County, made surveys in 1930 and 1931 to determine the extent of loss during seasons of serious late blight epidemics. The surveys were made the latter part of August at a time when all fields of the Green Mountain variety should have been green and still producing potatoes if they had been properly sprayed. The information obtained from these inspection tours is summarized as follows:

Table 4 - Summary of Aroostook County fields included in surveys of 1930 and 1931.

Year	Number observed	Number dead	Percentage dead
1930	671	436	65
1931	940	322	34

On Aroostook Farm (experimental) badly blighted, unsprayed plots yielded about 100 bushels less per acre in 1930 and 1931 (from

18 to 25 per cent less) than did the well sprayed plots. Weekly yield tests made in 1931 showed that plots killed by the disease the latter part of August yielded approximately 86 bushels or 20 per cent less per acre than they would have if allowed to mature. Another series of plots which were allowed to die early by neglecting the late spray applications yielded 21 per cent less than adjacent plots which received proper spray treatments and remained green and free from disease. Judging from these observations and yield studies it seems safe to estimate the loss at about 20 per cent of the total yield of the blight killed fields in 1930 and 1931.

It should be noted that in the accompanying table only fields killed by blight are recorded. These figures, of course, do not represent the entire yield reduction. There was considerable loss in fields that were less extensively infected. Losses in such cases are extremely difficult to estimate but must have been large when taken as a whole. Late blight was also more serious in southern Aroostook in 1931 than in the northern part where potato culture is more concentrated.

Field rot was extensive in some fields. Losses from field rot were probably from a trace to 1 per cent on high well drained soil and from 25 to 50 per cent on lower fields with heavier soil.

In spite of these losses Aroostook produced over 50 million bushels of potatoes in 1931. If the 940 fields are considered representative, the 34 per cent of them that were dead, with a loss of 20 per cent, would give a loss of about 7 per cent of the total possible yield.

GRAY MOLD ROT OF POTATOES CAUSED BY BOTRYTIS CINEREA: Reference to Chupp's "Manual of Vegetable Garden Diseases," Pages 437 and 438, indicates that potato fields may occasionally be affected seriously by gray mold rot due to Botrytis cinerea. In Maine in 1931 I saw three fields in which the vine growth was very rank. Under such conditions the lowest leaves were much shaded and most of them were dead or dying and the fungus was fruiting copiously on them. In some instances it apparently had girdled the stems. In one field in particular the tops died one or two weeks earlier than would be expected in consideration of the other pests and diseases present. This field was on an experimental farm and did not show a single lesion of the late blight fungus on vines or tubers. A thorough coating of the plants with Bordeaux mixture had been applied at the proper times but this did not seem to affect the progress of the gray mold rot. On the same farm the disease was also found in insect cages, causing lesions on the leaves and stems, from which lesions the fungus was readily obtained in pure culture.

DISEASES OF SPECIAL CROPS

RECURRENCE OF TOBACCO DOWNY MILDEW IN GEORGIA

J. G. Gaines

Tobacco downy mildew (Peronospora hyoscyami), Mosaic (virus), and root knot (Caconema radicicola) were all found in a seed bed at Tifton, Georgia, December 30, 1931. The downy mildew was found on both young and old plants, approximately 20 per cent of the plants showing some infection.

Thus far (January 27, 1932) during the present winter there has been no freeze or killing frost in South Georgia. Due to the unusually warm weather, tobacco seedlings in early plant beds are growing rapidly; and suckers from original stalks left unmolested in 1931 beds continue to grow. In a few instances live tobacco stalks may be seen in open fields.

Traces of downy mildew (Peronospora hyoscyami) were seen January 21 on six weeks old tobacco seedlings in one bed of volunteer plants in Tift county. To date (January 27) the disease has been found in two such beds, one covered with cheesecloth and the other uncovered. At the time of observation the seedlings had from four to six leaves, the largest being slightly more than one-quarter inch in diameter. While only a very small percentage of plants showed symptoms, some few were so severely affected as to be killed. Mildew has also been observed on old plants in three 1931 discarded beds, but no symptoms have been found in the open field.

Traces of root knot (Caconema radicicola) were observed January 22 on six weeks old seedlings in one volunteer bed. Symptoms were abundant on the roots of old stalks left standing in this location in 1931. It is not the general practice of growers to use plants from such volunteer beds.

Damping-off (Rhizoctonia sp.) has been found in four beds in Tift county. One had been steam sterilized while the other three had not been treated. At the time of observation (January 26) symptoms were noted on the smallest plants just emerging and on larger ones with as many as eight leaves. However, only a few plants were affected, and no losses have been sustained.

DISEASES CAUSED BY NEMATODES

NOTES ON NEMIC DISEASES

G. Steiner

Tylenchus tritici was observed in a sample of wheat received from China (through Mr. Limber of the Inspection House); about 10 per cent of the wheat was affected.

Tylenchus dipsaci was again observed in onions from England and Holland intercepted at Philadelphia and the Inspection House at Washington, D. C.; and in Irish potatoes from England intercepted at Philadelphia.

Tylenchus pratensis was observed for the first time in cyclamen roots which came from a greenhouse in Arlington Farm, Va.

ROOT KNOT IN NORTH CAROLINA

R. F. Poole

The losses resulting from root knot due to Caconema radicicola are definitely increasing in importance. Fruit trees, vegetables, field crops and ornamentals are already widely affected, but newly infected areas are demonstrated every year. Tobacco, tomato, peppers, sweet potato, cabbage, bulbs, berry plants and trees are widely exchanged, especially so in recent years, and since the host range is so large it is not easy to avoid infected plants. In certain seasons, the disease is worse, and appears on clay soils as well as on sandy soils. In 1931 the disease was severe on Cecil Clay soils as far west as Davidson County.

The symptoms are misleading and not readily diagnosed by growers. In many cases the disease does not kill the plant, but causes severe stunting, dying back, malnutrition, etc., that are not often thought of by the grower as due to this disease.

In experiments with ground sulfur broadcast at the rate of 200, 400, and 600 pounds to the acre on four 20-acre plot replications there was no infection of the Nancy Hall sweet potato, a very susceptible plant, on plots receiving 400 and 600 amounts, and much less infection on plots that received 200 pounds than on check plots.

MARKET PATHOLOGY

NEW YORK MARKET PATHOLOGY NOTES

J. S. Wiant

CARROTS: A car of carrots from Michigan contained 20 per cent bacterial soft rot (Bacillus carotovorus) part of which followed freezing injury.

POTATOES: An unusually high amount (15 per cent) of spindle tuber was noted in a car of Green Mountain potatoes from Maine.

APPLES: Specimens of Winter Banana apples showing soft scald (physiological) were received from a New York grower who reported that 50 per cent of those placed in a cold storage warehouse were affected with this trouble.

PINEAPPLE: Five per cent of the pineapples in a shipment from Porto Rico were affected with a decay caused by Fusarium sp. Although this disease is occasionally seen here it is uncommon to find such a high percentage of it, particularly in a shipment such as this which contained only a trace of black rot (Thielaviopsis paradoxa).

ORANGES: A boat shipment of 300 boxes of oranges from central Florida contained approximately 3 per cent stem-end decay (Diplodia natalensis and Phomopsis citri) and 2 per cent blue mold (Penicillium spp.). These figures are fairly representative for the Florida oranges which were shipped by boat this season.

CORRECTION

Dr. Ray Nelson has called attention to an error in Supplement 81, on Page 118, under celery yellows. The disease of celery caused by the aster yellows virus has not been reported from Michigan. Celery yellows in Michigan is due to a species of Fusarium.

The report from Wisconsin under the same heading, however, is correctly cited.